Quantifying Climate Feedbacks from Abrupt Changes in High-Latitude Trace-Gas Emissions

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Tested Hypothesis: There exists a climate warming threshold beyond which permafrost degradation becomes widespread and thus instigates sharp increases in methane emissions (via thermokarst lakes and/or wetland expansion). These would outweigh any increased uptake of carbon (e.g. from peatlands) and would result in a strong, positive feedback to global climate warming.

Objective: Quantify the potential for threshold changes in natural emission rate of trace gases, particularly methane and carbon dioxide, from pan-arctic terrestrial systems under the spectrum of anthropogenically forced climate warming, and the extent to which these emissions provide a feedback.